Aim

To determine olfactory detection thresholds and compare data over species for seven aromatic aldehydes. Also possible odor structure-activity relashionships are accessed.

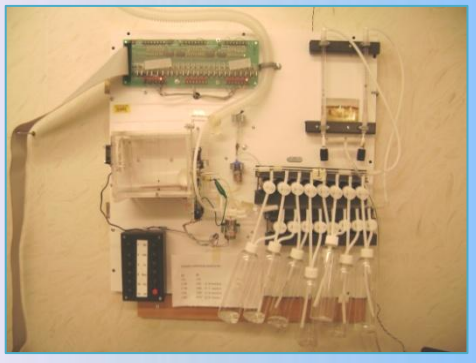

Figure 1. The automated olfactometer used in the study

Introduction

Using an automated olfactometer detection threshold values for seven aromatic aldehydes were determined. Little is known about olfactory sensitivity in mice at an organismal level and only a dozen odorants have been investigated.

Results & Discussion

The animals discriminated odorant concentrations as low as

10 ppb (parts per billion) for canthoxal and 3-PPA

1 ppb for helional, lilial, cyclamal and lyral

0.1 ppq (parts per quadrillion) for bourgeonal

from the odorless solvent.

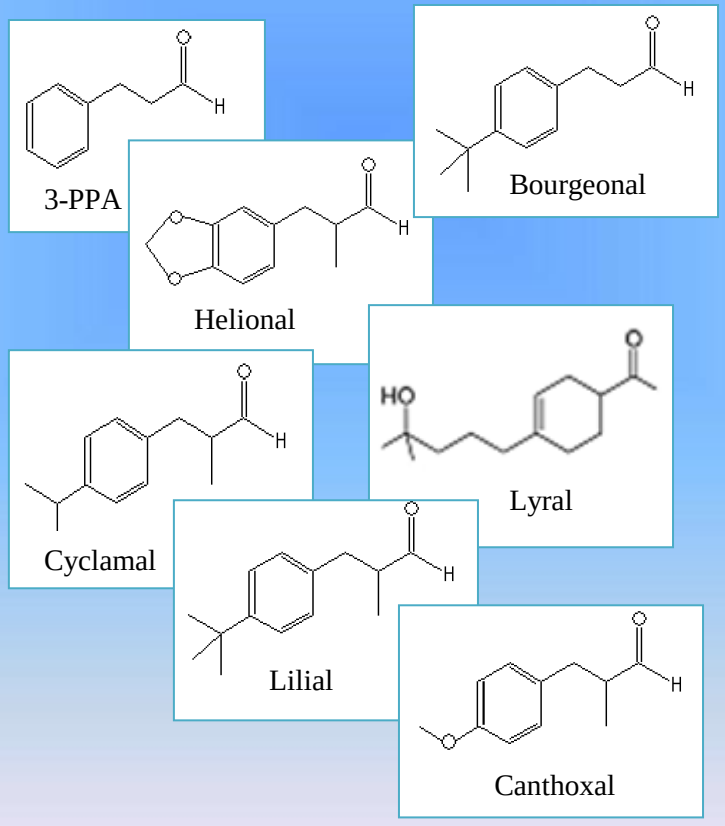

Figure 2. Molecular structure of aromatic aldehydes used in the study

By comparing the data with those obtained in other species no clear correlation between olfactory sensitivity and number of olfactory receptors could be found.

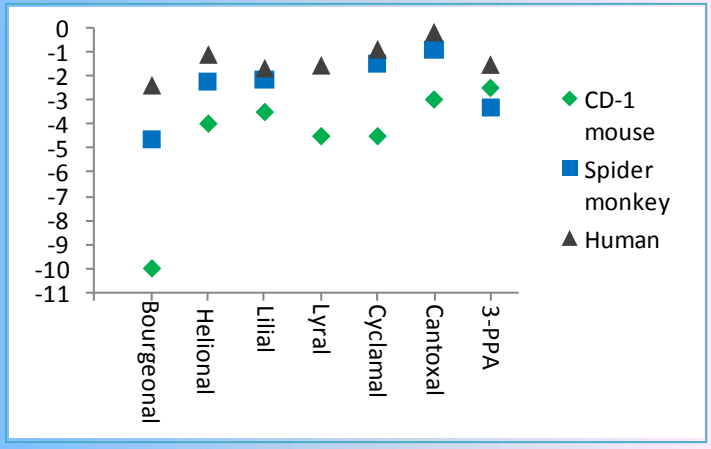

Figure 3. Detection threshold value comparision over species in vapor phase concentration (log ppm (parts per million))

Detection threshold values were found to be affected by molecular structure such as type of functional groups and oxygen moiety attached to the benzene ring.

Conclusion

Bourgeonal yielded the by far lowest detection threshold value ever reported for any odorant in mice.

No clear correlation could be seen between olfactory sensitivity and the size of the olfactory receptor repertoire.

Threshold values varies with molecular structure.

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Olfactory sensitivity in CD-1 mice for the sperm-attractant bourgeonal and some of its structural analogues

Linda Larsson

Final Thesis
Master Programme in Molecular Genetics and Physiology 2010

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